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ABSTRACT

This paper describes a study that tested the effects of an educational intervention on the alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of high-risk drinking college students. Knowledge items measured cognitive awareness of alcohol risks. Normative beliefs and attitude measures reflected misperceptions of others' drinking. Psychosocial skill measures entailed perceived ability to intervene during an alcohol emergency and personal skills to refuse alcohol. These specific variables were deemed important to the health, well-being, and academic achievement of college students, especially frequently bingeing students who may be at high risk for alcohol-related problems. The research was conducted in two phases: a baseline measure to identify binge drinkers and a pretest and posttest intervention study that entailed delivering and evaluating an alcohol education program for the identified sample of 234 binge drinkers. The intervention study entailed a two-group, quasi-experimental design to test the effects of a 10-hour alcohol education intervention on alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of high-risk, bingeing students. Results indicated that posttest, intervention students had greater knowledge scores and higher perceived ability to intervene during an alcohol-related emergency than did control group students. (Contains 32 references.) (SM)

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A Pilot Study of an Alcohol Education Intervention Targeting the Frequently Binge-Drinking College Student

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The Pennsylvania State University College of Health and Human Development provided funding for this project as part of a seed grant initiative for junior-level faculty members. Portions of this data were presented during the October, 1999 annual meeting of the American School Health Association; and during March, 2000 at the annual meeting of the American Alliance for Health, Physical Education, Recreation, and Dance.

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ABSTRACT

This paper reports results of a pilot study testing the effects of an educational intervention on the alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of high-risk drinking respondents attending a large northeastern university during the 1998/1999 academic years. The knowledge items measured cognitive awareness of alcohol risks such as fact versus myth. The normative beliefs and attitude measures reflected misperceptions of others' drinking. Psychosocial skill measures entailed perceived ability to intervene during an alcohol emergency and personal skills to refuse alcohol. These specific variables were deemed important to the health, wellbeing, and academic achievement of college students, especially frequently bingeing students who may be at high risk for alcohol-related problems. The conceptual frameworks supporting this study include Botvin and Botvin's [1] "social resistance" approaches to substance abuse prevention, Hansen's [2] "social ecology" theory of alcohol and other drug prevention, and Perkins's [3] (1997) extension of peer socialization theory, contemporarily labeled "normative beliefs." The research was conducted in two phases: (1) a baseline measure to identify binge drinkers, and (2) a pretest and posttest intervention study that entailed delivering and evaluating an alcohol education intervention for the identified sample of binge drinkers. The baseline measure identified 234 high-risk binge-drinking respondents. The intervention study entailed a two-group quasi-experimental design to test the effects of a 10-hour alcohol education intervention on alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of high-risk bingeing students. Results of data analysis showed that at posttest measure respondents had greater knowledge scores and higher perceived ability to intervene during an alcohol-related emergency than did control group respondents.

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A Pilot Study of an Alcohol Education Intervention Targeting the Frequently Binge-Drinking College Student

For many undergraduate students, alcohol consumption is fundamental to the college experience. Following the widely publicized deaths of three MIT undergraduate students, an undergraduate news reporter eloquently noted that "the hyperactive stupor of a wild party is at least as much a part of student life as the controlled intellectual exercise of the classroom"[4]. Indeed, heavy alcohol consumption, also referred to as "binge" drinking, and more recently as "high–risk" or "immoderate" drinking, has increasingly come to the attention of politicians, attorneys, academic administrators, parents, faculty, staff, and students [5, 6, 7, 8, 9].

Binge drinking has been defined as consuming four or more alcoholic beverages in a row for women, and consuming five or more alcoholic beverages in a row for men, within the last two-week period [9, 10]. Other nationally known alcohol researchers [5] have reported that men who consume 21 or more drinks weekly or women who consume 14 or more drinks weekly are considered to be "at-risk" for acute and chronic health consequences.

Between 1993 and 1999, three large-scale nationwide surveys of college student drinking documented that approximately two of five students reported binge drinking [9,10,11] and that among drinking respondents the number who drank to get "drunk" rose to 52% in 1997, up from 39% in 1993. Wechsler [11] noted that the number of frequent binge drinkers significantly increased during the four-year period 1993-1997 and continued to increase significantly during the two-year period 1997-1999. Problems documented to be related to heavy alcohol use include poor academic performance, damaged relationships, unsafe sexual practices, physical violence, date rape, property damage, and suicide [9, 10, 11, 12, 13, 14, 15, 16]. Reports on alcohol-use

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trends show that the overwhelming majority (80%) of American youth consume alcohol before their 21st birthday and many feel pressured to engage in highly dangerous forms of consumption such as drinking contests and bar tours on their 21st birthday [8, 13]. Consequently, a national goal for the year 2010 drafted in Healthy People 2010 [18] is "to reduce to 20% the proportion of college students who report binge drinking within the last two weeks" (baseline was 38.3% in 1996). Likewise, the Centers for Disease Control and Prevention now include goals for reducing the use of alcohol, tobacco, other drugs, and violence related to alcohol use [19] as priority areas for prevention.

FINDINGS FROM RECENT ALCOHOL INTERVENTION STUDIES

Traditionally, target populations of early intervention services include alcohol or other drug users at unacceptably high levels of health risk, individuals whose use of alcohol results in dysfunction or negative consequences, or high-risk individuals or families defined by problem behaviors [20]. For example, alcohol-related educational interventions to date have provided service to early problem drinkers or students who are recurrently absent from school, drink and drive, are involved in violence, and/or sustain injuries [21]. This study diverges from traditional interventions such as the student assistance approach in that it involved assessing the "regular" student enrolled in required undergraduate classes. The researchers used these regular undergraduate classes to identify a sample of frequently binge-drinking respondents. The research rationale for targeting the frequently binge-drinking, or "high-risk" respondents, in this study is based on the documented high prevalence of alcohol-related problems among frequently binge-drinking college students, as noted above [9, 10, 12, 15, 16, 17].

Botvin and Botvin [1] report that social factors within the environment are "a powerful influence promoting the initiation of tobacco, alcohol, and drug abuse" (p. 765). The authors

suggest that individuals must develop a set of social skills or "generic personal competence" in order to navigate successfully through this social environment that will in all likelihood include pressure to use substances. They introduce an approach to prevention entitled "social resistance skills training" that has two distinct goals: "(a) the focus on increasing participants' resistance to negative social influences to engage in substance use, and (b) the focus on skills training" (p. 768). Resistance skill training involves "teaching students how to recognize situations in which they will have a high likelihood of experiencing peer pressure to smoke, drink, or use drugs. Botvin and Botvin [22], in an earlier review of prevention strategies and recommendations for assessment, noted that "future research is needed to further refine and test these prevention models, and that attention should be given to determining the effectiveness of such prevention approaches with high-risk populations" (p. 299).

"Social ecology theory," which has been espoused by William Hansen [2], argues that social structures exist during college that provides support to alcohol use and abuse. For example, rather than focusing on individual causes of problem behavior, Hansen [2] considers the larger social environment as a crucial element for understanding alcohol use, misuse, and abuse. Social ecology considers factors such as culture, tradition, rituals, interpersonal relationships, group value systems, and social norms as significant to one's decision to use alcohol. He considers alcohol use in the context of "social influence," which includes two primary variables that mediate alcohol use and misuse: (1) normative beliefs, as described below, and (2) social exposure to alcohol and other drugs. In general, social exposure to alcohol occurs via friends and acquaintances; in dormitories; at parties, cafes, or nightspots; or during athletic events [2].

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Perkins [3] diverges from either individual or social causes of alcohol use and postulates that alcohol education programs must (a) "simultaneously consider both the psychological concerns about cognitive functioning and sociological concerns about peer group and institutional effects; and (b) be translatable into practical programmatic initiatives that can be applied at primary, secondary, and tertiary levels of prevention" (p. 178). He focuses on student misperceptions of drinking behavior from a theoretical perspective of social psychology, suggesting that friends' attitude toward drinking typically is viewed as more liberal than it actually is. Perkins's [3] research on college student drinking norms showed, for example, that "virtually no one perceived the general norm to be conservative, only about one-third perceived it as moderate (the actual norm), and almost two-thirds saw their peers on campus as having a liberal attitude toward drinking" (p. 184). The process of misperceiving the drinking norm can occur as follows: (a) students drink heavily because they perceive the norm to be more permissive than it actually is, (b) the heavy drinking in turn becomes misperceived by other students, and (c) this misperception directly promotes increased personal use. Perkins [3] initiated a growing body of literature showing that "college students overestimate the use of drugs and the permissiveness of their peers. Their peers in reality are more moderate in both use and attitudes, and more of them are nonusers than students typically think" (p. 200).

PURPOSE

The primary purpose of the pilot study was to test the effect of a 10-hour alcohol intervention program on the alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of undergraduates attending a large northeastern university. It was hypothesized that as a result of an educational intervention, the "high-risk intervention respondents" would report: (a) greater knowledge of alcohol risks; (b) more accurate

perceptions about alcohol such as the role alcohol plays in the individual's life, ability to intervene, normative beliefs, and skills to refuse; (c) higher motivation to change alcohol-related behaviors; and (d) lower alcohol consumption per week than control group respondents.

METHODS

This study entailed a secondary prevention effort targeting a select group of high-risk drinkers using an alcohol-education intervention. The purpose of the pilot study research was to test the effect of a 10-hour alcohol intervention program on the alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of high-risk drinking undergraduates. Most of the outcome measures used during the study were composed of multi-item self-report scales.

Research Design

A two-group quasi-experimental design was employed to test the effects of an educational intervention on the alcohol-related knowledge, normative beliefs, attitudes, and psychosocial skills of undergraduate students who were high-risk drinkers. The study was conducted during two phases: (1) a baseline measure to identify a sample of frequent binge drinkers, and (2) an intervention study that entailed developing, implementing, and evaluating an alcohol education intervention for the identified sample of binge drinkers. The baseline questionnaire was administered to volunteers enrolled in "Introduction to Psychology" and "General Health Science" courses to identify students at highest risk for alcohol-related problems. During the baseline measure, a drinking history was administered to identify a sample of respondents who had binged frequently over the past six months. Frequent binge drinking was defined as bingeing a minimum of three or more times during one setting over the past six months [9]. Using this standard definition of frequent binge drinking, the researchers stratified respondents based on risk-level (i.e., high-risk versus non-risk) to identify a subset of the

baseline measure respondents who reported frequent binge drinking. Next, the high-risk respondents were assigned at random (i.e., via even and odd enumeration) into intervention and control groups. In exchange for their voluntary participation, intervention members received $75 cash, while control group members received a free pizza coupon. Intervention group members were required to complete pretest and posttest questionnaires and attend a 10-hour educational intervention in exchange for payment. Control group members were required to complete both pretest and posttest questionnaires to receive a free pizza coupon. The two groups received different treatments (i.e., education versus no education) to isolate the effect of the 10-hour alcohol education intervention.

Sampling Methods

Of the 577 respondents who completed the baseline measure, 287 (49.7%) reported "frequent" binge drinking. Two hundred and thirty-four of the frequent binge drinkers provided accurate follow-up information. These 234 were divided equally into intervention (n = 117) and control (n = 117) groups and mailed invitations to participate in the intervention study.

Of the 117 intervention group members, 28 agreed to participate in the alcohol education intervention resulting in a 23.9% response rate. Four respondents dropped out prior to the first session, reducing the intervention group size to 24, and the response rate to 20.5%. At the conclusion of the alcohol intervention, a total of 19 intervention group members attended all sessions and completed both pretest and posttest questionnaires. Fifty-nine of the 117 control group members (50.4%) agreed to participate by submitting a completed pretest questionnaire. Thirty-nine of the 59 control group members completed both pretest and posttest questionnaires reducing the response rate to 33.0%. The disparate participation rates between control (33.0%) versus intervention groups (20.5%) is very likely related to requiring attendance at the 10 one-

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hour, weekly, alcohol education sessions for the intervention group members. The control group had only to complete the pretest and posttest questionnaires to receive the free pizza coupon.

Measures

Baseline data were collected over a two-week period during Fall Semester, 1998 using an instrument by Wechsler, et al. [9]. This two-item scale, which has been used in nationwide studies and reported widely, measures gender differences in bingeing frequency among college students.

During the second phase of the study, a self-report inventory was administered to intervention and control group members to measure alcohol-related norms, perceptions, and practices. The alpha reliabilities, which model internal consistency of items, for each subscale are described below. The "motivation to change" scale (α = .86, 16 items) included contemplation questions such as, "I think I might be ready for some self-improvement around alcohol" [23]. Scale two, "role of alcohol in life" (α = .59, 2 items) measured importance of alcohol in one's life (e.g., "drinking is important to my life as a student)." The third scale, entitled "ability to intervene" (α = .64, 4 items) measured statements such as, "I know what to do during an alcohol-related emergency." A fourth scale entitled, "skills to refuse" (α = .83, 14 items) measured personal and psychosocial confidence to refuse alcohol [24, 25] through statements such as, "I am confident in my ability to refuse an alcoholic beverage." The fifth scale measured knowledge about alcohol use (r = .34, 12 items) and was formatted as true and false; statements such as "taking a nap helps you to sober up" were used. The sixth scale assessed students' "perception of drinking norms" (α = .80, 8 items) and was an environmental assessment [26] that measured the respondents' perception of other students' use of alcohol (e.g., respondents rated the proportion of their friends who they believe were heavy drinkers).

Intervention

The educational intervention was implemented over 10 weeks during Spring Semester, 1999. The intervention, designed specifically for this research project, was guided by the theoretical and educational principles of social resistance, social ecology, and normative beliefs [1, 2, 3, 22, 31]. The four intervention goals were: (1) learn about the alcohol climate and associated risks; (2) clarify normative beliefs surrounding alcohol use, misuse, and abuse; (3) examine alcohol-related attitudes; and (4) practice psychosocial skills to reduce the misuse and abuse of alcohol. Participants met once per week over the 10 weeks. The intervention incorporated multiple teaching methods including didactic presentations, self-analysis, behavioral monitoring, small-group work, role-play, and interactive learning using a computer-assisted software program [27]. The following course outline was used: (1) pretest, introduction, philosophy, purpose, and confidentiality; (2) binge drinking, misperceptions, and national drinking norms of college students; (3) average serving sizes of beer, wine, and liquor; (4) behavior change and maintenance; (5) blood-alcohol levels; (6) alcohol poisoning and alcohol-impaired driving; (7) communication styles; (8) effective use of refusal and communication skills; (9) stress management and relaxation skills; and (10) review, wrap-up, and posttest.

Analysis

A total of 58 respondents constituted the intervention and control groups. First, the authors determined "population bias" estimates by applying analyses of variance and chi-square tests to determine whether significant differences existed between the baseline measure non-risk (i.e., not bingeing three or more times within the last six months) and baseline measure high-risk (i.e., bingeing three or more times in the last six months) respondents. These results showed that

the non-risk baseline respondents did not differ significantly from the baseline high-risk respondents with regard to most variables: grade point average [F (1,548) = 1.07, p = .30]; major [X^2 (9,547) = 12.46, p > .10]; or religion [X^2 (5,548) = 9.91, p = .08]. The non-risk respondents at baseline did differ significantly, however, from the high-risk group with regard to gender [X^2 (1,522) = 7.69, p < .01]; year in school [F (1,546) = 12.86, p < .001]; and age [F (1,549) = 4.11, p < .05]. More high-risk respondents were female and underclassmen than male and upperclassmen.

Next, a series of frequency analyses, t-tests, and analyses of covariance was computed. Since the non-risk baseline group and the high-risk baseline group did differ on a few of the demographic variables, the statistical analysis applied to the intervention results (i.e., data collected from the intervention and control group members) was analysis of co-variance. Analysis of covariance was the appropriate statistical measure in that it can control for the presence of group differences at pretest measure, thus allowing the examination of differences between groups at posttest measure. The results are described below.

RESULTS

A total of 58 students found to be at high risk fully participated in the two-group quasi-experimental study by providing matched cases of pretest and posttest measures. The overwhelming majority (93.1%) of respondents reported consuming alcohol within the past 30 days of pretest. The high-risk women consumed an average of 12.0 (SD = 6.80) average servings of alcohol per week, while the high-risk men consumed an average of 16.11 (SD = 8.66) average servings of alcohol per week at pretest measure. It is important to note that the intervention group (n = 19) and control group (n = 39) respondents were similar. That is, no significant differences between the intervention and control group respondents, all of whom were

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at high risk, were found with regard to grade point average, major, religion, gender, year in school, and age at pretest measure.

Data were analyzed with regard to the presence of differences *between* and *within* intervention and control groups based on responses to the measures described above. Likewise, a series of analyses of variance procedures was conducted to determine the presence of any significant differences between intervention and control group members' demographic characteristics. Sixty-nine percent of participants in the intervention study were women and 31% were men. The majority of high-risk respondents, 98.3%, were between 18 and 22 years of age. Similar to the baseline group, the class standing included fewer Sophomores (19%) or Juniors (15.5%) than Freshmen (34.5%) or Seniors (25.9%). Most (84.5%) of intervention study respondents did not belong to a fraternity or sorority, nor did they participate in varsity athletics (98.3%). Intervention and control group respondents drank nearly twice the national average weekly high of 5.7 drinks per week among women, and 7.8 drinks per week among men.[27]

Shown in Table 1 are the within-group means, standard deviations, and paired t-test results of high-risk respondents with regard to their alcohol-related knowledge, role in life, perceived ability to intervene, drinking norms, refusal skills, motivation to change, and total alcohol consumption per week at pretest and at posttest. With regard to pretest results, the intervention and control groups were fairly similar concerning alcohol-related knowledge, role in life, skills for refusing, and total weekly use. A series of paired t-test measures showed no significant differences *within* the intervention or the control group on all of the variables, except perceived ability to intervene during an alcohol emergency. That is, at the conclusion of the intervention, control group respondents showed no statistically significant differences in perceived ability to intervene, while the intervention group's scores increased significantly

($t = -4.70$, $p < .001$) from pretest ($X = 11.0$) to posttest ($X = 13.42$).

Insert Table 1 About Here

The researchers used an analysis of covariance procedure to test posttest differences *between* the intervention and control groups while controlling for the presence of group differences at pretest. The small number of participants in the study, however, limits the ability to detect differences between groups and differences over time. A power analysis estimates that for a study of this size, an analysis of covariance has a statistical power of 0.67 for detecting "large effect sizes" [32]. Thus, the current study may not have been sensitive to measuring small differences in knowledge, attitudes, and practices between groups and over time.

Six univariate analyses of covariance tests were conducted to determine differences between intervention and control groups on total alcohol consumption, knowledge, motivation to change, perception of drinking norms, skills to refuse alcohol, and binge drinking behavior. The analysis of covariance results documenting significant differences between intervention and control group respondents at posttest are presented graphically in Figures 1, 2, 3, 4, 5.

Knowledge gain was shown to have the largest effect. At posttest measure, for example, the intervention group respondents reported greater alcohol-related knowledge than the control group respondents. Using pretest knowledge scores as a covariate, the researchers found that alcohol-related knowledge measures were significantly ($p < .01$) different between the two groups at posttest. The adjusted mean knowledge score ($X = 10.63$) of the intervention group was significantly higher than the mean knowledge score ($X = 9.72$) of the control group [$F(1,57) = 8.01$, $p < .01$] at posttest, as illustrated in Figure 1.

Insert Figure 1 About Here

Likewise, a second effect was shown with regard to perceived ability to intervene during an alcohol-related problem or emergency. Using the variable "perceived ability to intervene" as a covariate, the researchers controlled for the effect of potential differences between groups at pretest measure; as shown in Figure 2, the two groups' perceived ability to intervene differed significantly ($p < .01$) at posttest. Consistent with Botvin and Botvin's [1] prevention model, at posttest, intervention group respondents reported a higher level of perceived ability to intervene ($X = 13.42$) than did the control group respondents ($X = 11.31$) [$F(1,57) = 18.70$].

Insert Figure 2 About Here

Finally, the finding regarding respondents' perceptions of the drinking norm (see Figure 3) at posttest was inconsistent with Perkins's [3] normative beliefs model. Intervention group respondents perceived more drinking among peers than did control group respondents at posttest. When controlling for pretest differences, the results showed posttest group differences with regard to the perceived drinking norms of college women. At posttest, intervention group respondents perceived that university women drank significantly ($p < .001$) more ($X = 7.95$) drinks per week than did control group respondents ($X = 6.26$) [$F(1,57) = 19.82$]. This finding is not necessarily curious. Given that women in the intervention group consumed an average of 12 drinks per week, it is possible that they were simply overestimating the norm by projecting personal beliefs about others' drinking that are more consistent with their own behavioral practices.

Insert Figure 3 About Here

Similarly, as shown in Figure 4, another intriguing result emerged at posttest measure. Intervention group respondents perceived that university men drank significantly ($p < .01$) more drinks per week ($X = 8.95$) than did control group respondents ($X = 7.85$) [$F(1,57) = 10.89$].

This finding also may be the result of statistical power, respondents' personal bias, or intervention group members' becoming sensitized to others' drinking practices during the intervention.

Insert Figure 4 About Here

At posttest measure, the total amount of alcohol consumed during a typical week by intervention and control group respondents did not differ significantly ($p = .30$) [$F(1,57) = 1.12$]. Specifically, at posttest measure, intervention group respondents reported consuming 13.7 average servings of alcohol per week, while control group respondents reported consuming 13.9 average servings of alcohol per week. These results are discussed more thoroughly in the next section.

Insert Figure 5 About Here

DISCUSSION

In this study, nearly half of the baseline measure respondents ($n = 287$) were classified as frequent binge drinkers. Additionally, the intervention group respondents who participated in the study reported drinking twice the national weekly average [27] of alcohol; on average, the women consumed 12 drinks per week, while the men consumed 16 drinks per week. This pilot study research showed that students at high-risk for problem drinking who participated in an alcohol intervention program reported increases in alcohol-related knowledge and perceived ability to intervene in an alcohol-related emergency. This research provides evidence that one of the theoretical constructs [1, 22, 24] supporting this research was significantly related to the purpose of the study, while other theoretical constructs functioned less well [2, 3]. At posttest measure, the intervention students knew more about the side effects and psychosocial

consequences of alcohol misuse and abuse than control group students. Additionally, at posttest, intervention students believed they possessed greater skills necessary to intervene during an alcohol-related problem or emergency (e.g., halting a drinking game, escorting a friend to safety, or summoning an ambulance) than did control respondents.

The Botvin, et al.'s [1, 22, 24] social skills training approach to substance abuse prevention has relevance to our findings. The finding in this study that following a 10-hour alcohol education intervention, the intervention group respondents felt more confident in their ability to intervene during an alcohol related emergency than did control group respondents, is likely the result of having participated in cognitive and affective learning opportunities during the intervention program. That is, at posttest the intervention group respondents said they knew more alcohol-related information, and had higher confidence in their ability to intervene during an alcohol-related problem, than control group respondents said. In 1995 it was reported that 318 Americans died of alcohol poisoning, including 24 who were ages 15-24 [28]. Intervention group respondents who believe that they know how and when to intervene may feel confident to intervene when necessary. If their perceptions are accurate, it may translate into the prevention of future alcohol-related problems among their peers and families. Conversely, the intervention group may have been reporting a case of "overconfidence" in their ability to intervene that would not necessarily carry through behaviorally. Nevertheless, attitude change has been shown to be a necessary precursor to eventual behavior change [23].

The second major finding, that intervention group respondents perceived significantly higher ratings of college drinking norms than did control group respondents, is perplexing. Despite participating in an educational intervention to correct erroneous normative beliefs about drinking.[16, 27, 30] the intervention group continued to overestimate the drinking norms of both

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genders more than control group respondents. This individual intervention program was ineffective in terms of clarifying the perceptions of drinking dorms. It is quite possible that the measures used in this study did not offset sufficiently the psychometric issues of selection bias or social desirability. In addition, large-scale media programs [30] have recently been associated with reductions in the overestimation of drinking norms among those who were exposed to norm-based information.

Since behavior change was only one of several foci of this study, the researchers recognize that changes in knowledge and attitudes regarding alcohol-related practices are more likely to occur within 10 weeks than are changes in behavior. It is quite possible that the intervention group members would reduce drinking over the course of a college career or even during the following academic year, rather than what could be measured within a 10-week intervention. As described by Hansen [2], numerous factors such as "group values" and "environmental supports" increase the likelihood that a behavior will appear or persist. Likewise, Perkins's [3] evidence regarding the complexities of misperceiving the drinking norms also may apply to this finding. Perhaps intervention and control group members did not change in their personal drinking behaviors due to factors such as friendships, group values, social norms, and peer expectancies [2]. This may especially be true given that most of the respondents were Freshmen students. Another possible explanation is that these respondents were "enmeshed" in misperceiving the drinking norm and incapable of accurately reporting personal drinking behaviors.

CONCLUSIONS

Despite a number of significant findings that have been documented herein, the limitations of this study must be kept in mind. Primarily, the characteristics of volunteer participants, the low number of intervention group respondents, and the disparate nature of the intervention and control groups make it impossible to compare these findings to the intervention group; to baseline survey respondents; to students attending large, northeastern universities; or to other college student populations as a whole. In addition, 20% of baseline respondents failed to follow the directions required for the researchers to conduct accurate follow-up. It is possible, if not likely, that the 20% lost during attrition were frequent bingeing respondents, thus biasing the sample of high-risk drinkers. Finally, the baseline participants were a sample of convenience making it impossible to generalize these findings to all college students.

The authors realize the strict limitations of this study. Nevertheless, they also recognize the practical importance of pilot-study research to address prominent issues such as the frequently binge-drinking college student. While prevention research can be rewarding to its participants, it also is inherently flawed due to (1) the necessity of relying on volunteers, (2) inadequate funding, and (3) a tendency to over-rely on samples of convenience. The authors recommend a greater institutional commitment to systematically identify and refer frequently bingeing college students to intervention and treatment services.

Recent media attention focusing on the problems associated with alcohol use has emphasized the gravity of college binge drinking [5, 9, 10, 11]. Based on this research study's results, several conclusions can be drawn. First, nearly one-half of the respondents at baseline self-identified as binge drinkers. These findings are consistent with other researchers who have noted that two of five college students reported binge drinking [7, 9, 10]. There is evidence that

students engage in binge drinking as part of the peer socialization process, [3] and therefore implementing alcohol-free entertainment programs, especially those targeting first-year students, is recommended highly. Finally, the researchers recommend the four following ideas for future research: (1) replicating the intervention study using a larger sample of high-risk drinkers, such as students who have been referred to student services for violating alcohol policies; (2) replicating this study among similar-age non-university-bound populations to determine whether binge drinking is a function of college environments, or simply of developmental transitions into early adulthood; (3) employing a longitudinal design to ascertain whether high-risk drinking Freshmen are more likely to develop alcohol dependency during the course of their college experience than low-risk drinking Freshmen students; and (4) conducting a year-long study using a three-group experimental design to determine the extent to which the Maney [29] and Eable [31] teaching methods affected alcohol perceptions and consumption practices.

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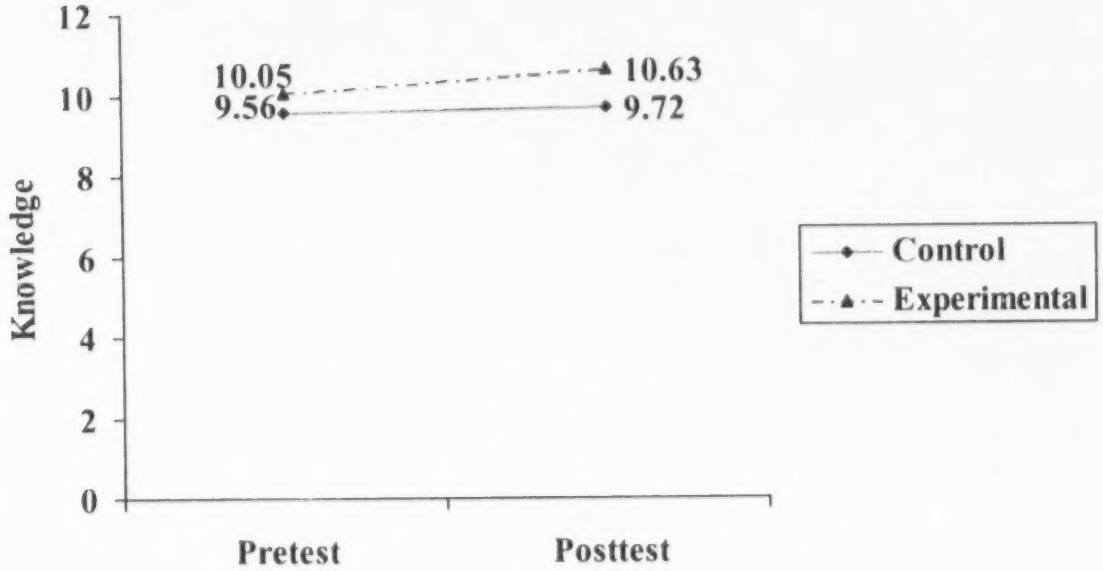
Table 1
Means, Standard Deviations and Paired T-Test: Within Group Results

Variable			Control Group	n	Experimental Group	n
Knowledge						
	Pretest	Mean	9.56	39	10.05	19
		SD	1.33		1.04	
	Posttest	Mean	9.72	39	10.63	19
		SD	1.14		0.76	
		T-Test (Sig.)	- .66 (NS)		-1.81 (NS)	
Motivation to Change						
	Pretest	Mean	18.13	39	20.21	19
		SD	6.78		3.72	
	Posttest	Mean	18.90	39	21.00	19
		SD	6.68		4.90	
		T-Test (Sig.)	-1.05 (NS)		-.63 (NS)	
Perceived Role of Alcohol in Life						
	Pretest	Mean	5.10	36	5.28	17
		SD	3.16		2.29	
	Posttest	Mean	5.16	36	5.56	17
		SD	3.26		2.64	
		T-Test (Sig.)	0.26 (NS)		- .70 (NS)	
Perceived Ability to Intervene						
	Pretest	Mean	11.30	39	11.00	19
		SD	2.45		2.43	
	Posttest	Mean	11.31	39	13.42	19
		SD	2.45		2.09	
		T-Test (Sig.)	0.00 (NS)		- 4.70***	
Perceived College Norms						
	Pretest	Mean	34.07	39	36.90	19
		SD	7.97		6.10	
	Posttest	Mean	34.43	39	38.94	19
		SD	7.40		3.39	
		T-Test (Sig.)	- 0.56 (NS)		- 1.35 (NS)	
Perceived Skills to Refuse						
	Pretest	Mean	39.23	39	38.10	18
		SD	7.05		7.35	
	Posttest	Mean	39.45	39	40.44	18
		SD	7.74		8.83	
		T-Test (Sig.)	- .26 (NS)		- 1.43 (NS)	
Weekly Alcohol Consumption						
	Pretest	Mean	13.61	36	12.50	17
		SD	8.52		5.30	
	Posttest	Mean	13.78	36	13.90	17
		SD	8.52		5.30	
		T-Test (Sig.)	0.51 (NS)		-1.02 (NS)	

Minimum and maximum scores: Knowledge 0-12, perceived role of alcohol in life 0-16, perceived ability to intervene 0-16, perceived college norms 0-81, perceived skills to refuse 0-68, motivation to change 0-48, and weekly total alcohol consumption
0 –63.

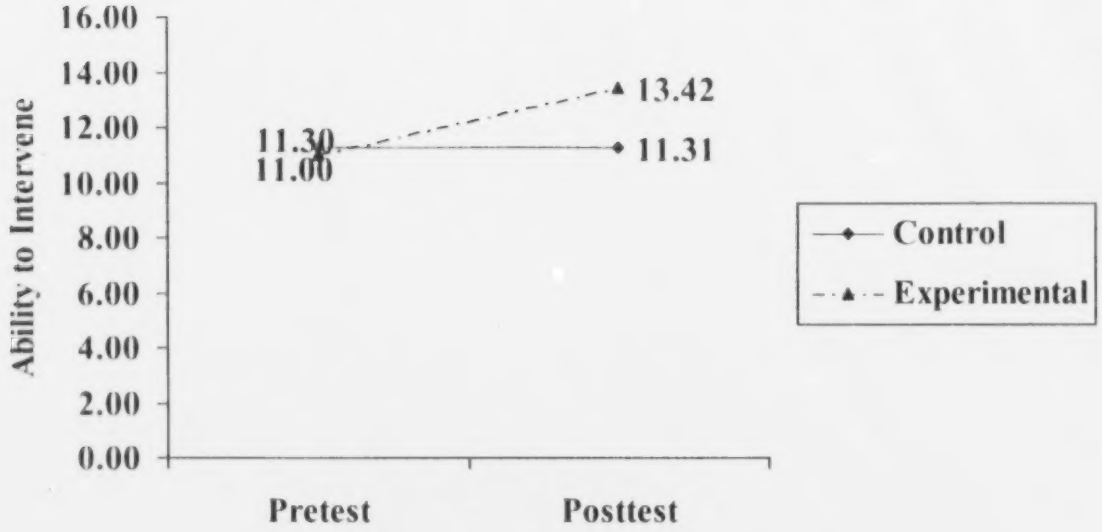
*** probability < .001

Figure 1. Mean Knowledge Scores of Experimental and Control Groups at Pretest and Posttest



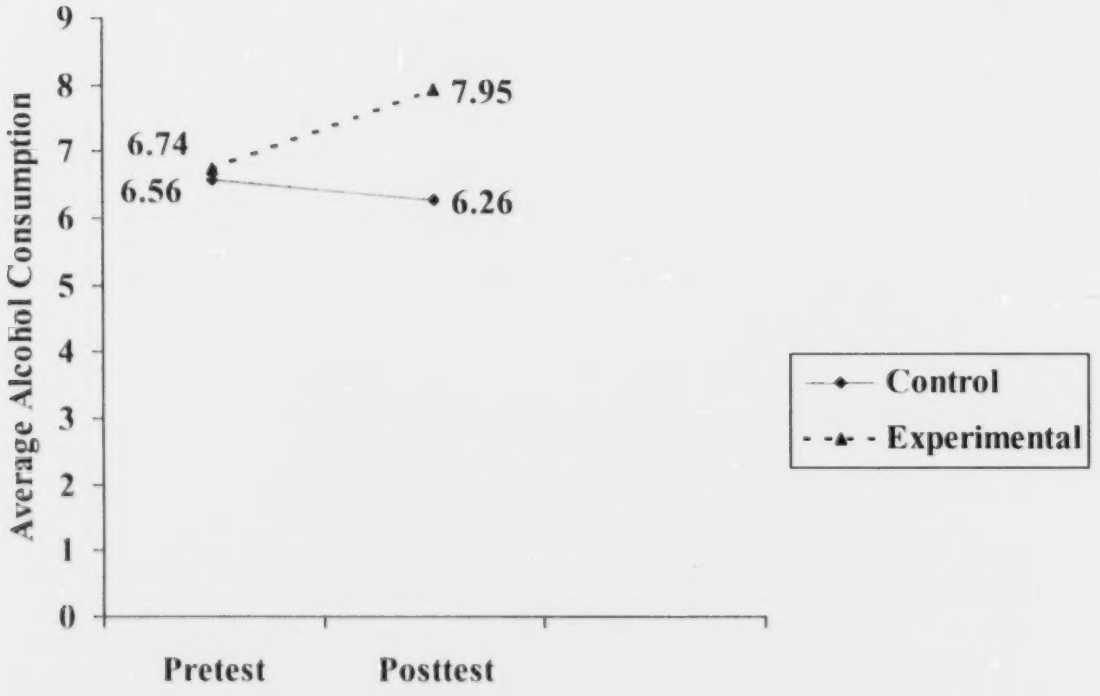
F= 8.01, df(1,57), p < .01

Figure 2. Mean Ability to Intervene Scores of Experimental and Control Groups at Pretest and Posttest



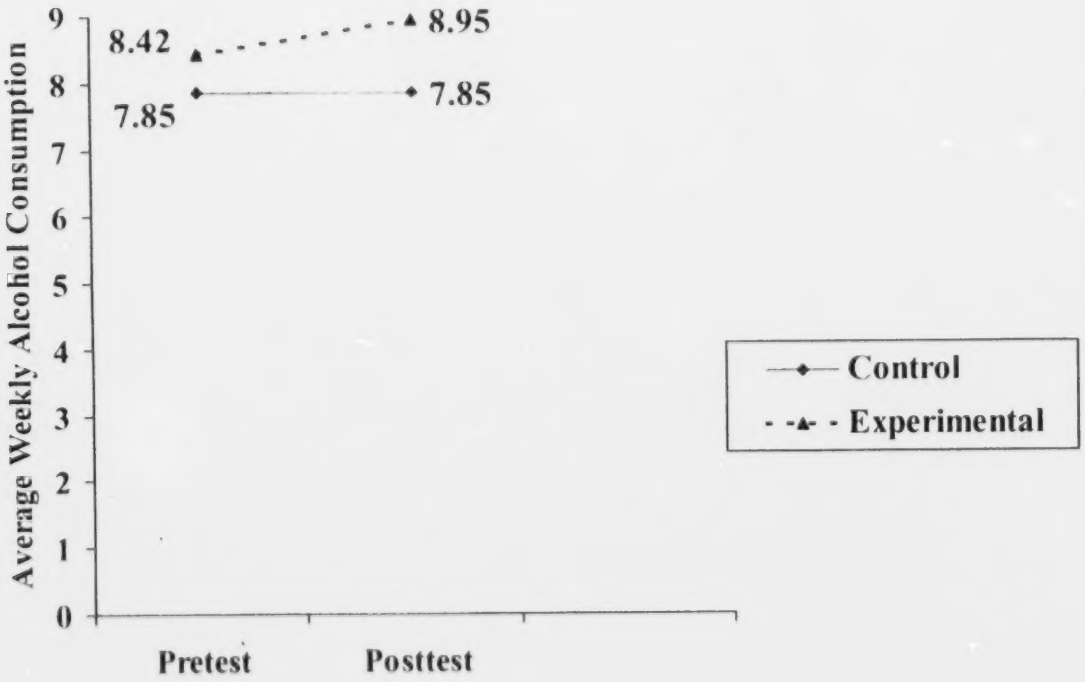
F = 18.70, df(1,57), p < .01

Figure 3. Perceived Weekly Consumption of Alcohol Among Women



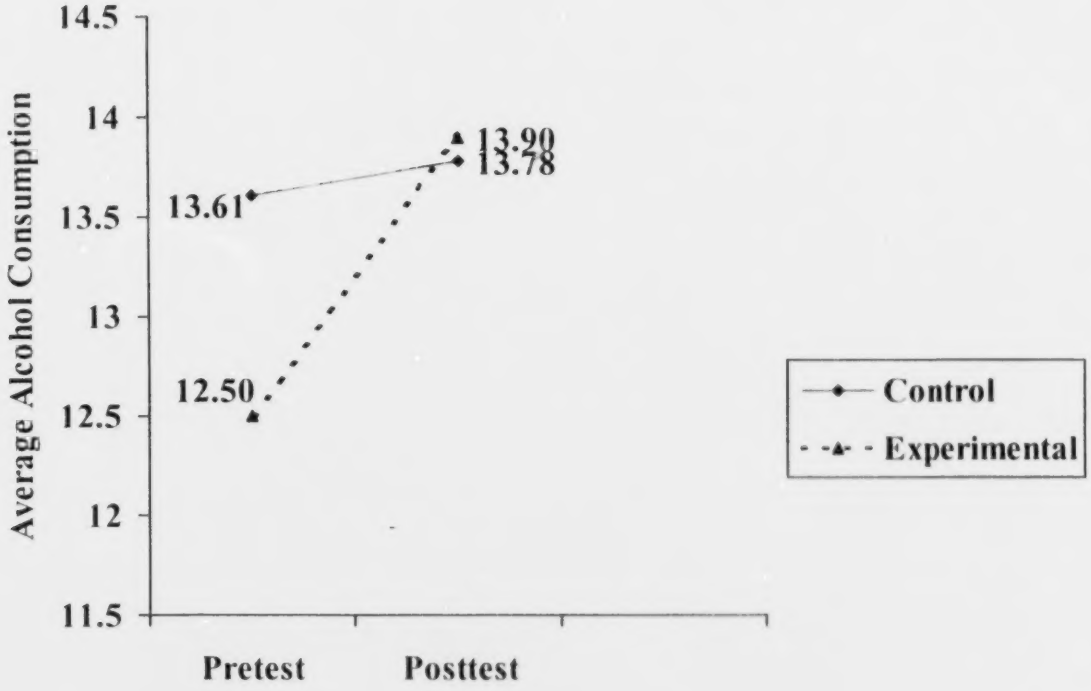
F = 19.82. df (1,57), p < .001

Figure 4. Perceived Weekly Consumption of Alcohol Among Men



F = 10.89, df(1,57), p < .01

Figure 5. Weekly Alcohol Consumption at Pretest and Posttest



F = 1.12, df(1,57), p = .30